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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/650,406

08/27/2003

Jong Moon Lee

51876P384

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8791

7590

12/12/2005

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EXAMINER

CAO, HUEDUNG X

ART UNIT

PAPER NUMBER

2821

DATE MAILED: 12/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/650,406

Applicant(s)

LEE ET AL.

Examiner

Huedung X. Cao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) 4-5 is/are allowed.
6) ☒ Claim(s) 1-3 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 27 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/21/05
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over OBERSCHMIDT et al. (USP 6,507,321 B2) in view of MURAMOTO et al. (US 6,342,864 B1).

As per claim 1, Oberschmidt teaches "a broadband slot antenna", comprising:

a dielectric layer under which microstrip feedline is formed (Oberschmidt, figure 3, substrate 1 and feedline 4, and column 5, lines 1-5);

ground formed on the dielectric layer and coupled with the microstrip feedline electromagnetically through a slot (Oberschmidt, figure 3, metallic layer 7, the metallic layer 7 is a conductive layer worked as a ground plane; column 3, lines 2-8); and reflection plane placed under the microstrip feedline (Oberschmidt, figure 3, reflector plane 14, column 4, lines 35-40, and column 5, lines 18-19) and having an open part with predetermined length and depth in order to prevent board surface waves from being radiated and enhance antenna gain which Oberschmidt does not explicitly disclose. However, Muramoto teaches such reflection plane having an open part with predetermined length and depth is widely use in the art (Muramoto, figures 6, 7A, 7B,

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column 4, lines 7-27). It would have been obvious to a person of ordinary skill in the art, to provide Oberschmidt's antenna system with reflector plane having an open part, as taught by Muramoto in order to adjust the directionality created by the slot antenna portion, so that a beam transmitted from or received by the slot antenna portion can be oriented in a desired direction, thus improving the directionality and the F/B ratio (i.e., front to back ratio) thereof.

Claim 2 adds into claim 1 "area of an entrance of the slot is the same as that of a bottom of slot or area of the entrance of the slot different from that of the bottom of the slot" (Oberschmidt, column 3, line 65-column 4, line 20; the slots 2 and 3 have the area of entrance being the same as that of the bottom of slot).

Claim 3 adds into claim 1 "reflection plane is a metal resonator" (Oberschmidt, figure 3, reflector plane 14, and column 5, lines 13-14).

Allowable Subject Matter

3. Claims 4-5 are allowed.

4. The following is an examiner's statement of reasons for allowance:

Regarding claim 4, Oberschmidt et al. (USP 6507321 B2) discloses a broadband slot antenna, comprising: a dielectric layer under which microstrip feedline is formed; ground formed on the dielectric layer and coupled with the microstrip antenna electromagnetically through a slot; and reflection plane placed under the microstrip feedline in order to prevent board surface waves from being radiated and enhance

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antenna gain. Oberschmidt, however, fails to teach a baffle layer formed on the ground conductor in order to prevent mutual coupling between the slot antennas. In addition, the art does not suggest the addition of a baffle layer for preventing mutual coupling between the slot antennas of a slot array antenna.

Claim 5 is allowed for depending on claim 4.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Inquires

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huedung Cao whose telephone number is (571) 272-1939.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong, can be reached on (571) 272-1834. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

6. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Huedung Cao', with a long horizontal line extending to the right.

Huedung Cao
Patent Examiner